

Stick 'em Up

Preparation Time:	Easy-to-do	Moderate	Extensive
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Grade:	4 – 5
Focus:	Airborne pollutants
Subject:	Social Studies, Science
Materials:	See list below
Teaching Time:	Two class periods (about a week apart)
Vocabulary:	Smog, particulate matter, airborne

the air, can be harmful to plants, animals and humans. Buildings and statues can be discolored.

Questions for the Class

1. Can we see air pollution? How do we know that air pollution exists?
2. Give examples of visible air pollution.
3. Discuss the concept of particulate matter.
4. List some sources of air pollution, both visible and invisible. Can a single source provide both visible and invisible air pollution?

Learning Objectives

Students will:

- learn that tiny particles are forever floating around in the air we breathe; and
- collect, observe and analyze these particles from various locations around their school or community.

Background

The air around us is invisible. It is made up of gases that cannot be seen. Many major air pollutants also are invisible gases. In some areas of the country, these air pollutants can build to levels where they can be seen. For example, in some cities, smoky, yellowish clouds of primarily car exhaust build up to create **smog**.

Other easily visible air pollutants, called **particulate matter**, are made up of tiny particles of solids or droplets of liquids. Some of these particulates are naturally occurring and may pose less of a problem to human health than man-made particulates. Some natural particulates include pollen, wind-blown dust and volcanic ash. Man-made particulates are generated by coal and oil-fired power plants and manufacturing plants, automobile and diesel fuels as well as fireplaces and wood-burning stoves among others. These **airborne** particulates, or particles carried through

Materials

- “Stick ‘em Up” worksheet
- scissors
- clear tape
- string
- hole punch
- magnifying glasses (microscopes optional)
- marker

Learning Procedure

1. Copy the “Stick ‘em Up” collectors so that each student has a particulate collector.
2. Cut four holes \pm 1.25 inches in diameter in the strip as marked. Using the hole punch, make a hole in the top and tie the string into a loop.
3. Cover one side of the strip with clear tape so that the holes are covered on one side. **DO NOT TOUCH THE STICKY SIDE OF THE TAPE SHOWING THROUGH THE HOLES.**
4. Select different sites around the school to hang the Stick ‘em Up collectors. On each strip, write the student’s name, location, date and time it is hung. Site selections may include your classroom, the hall outside your classroom, the gym, bathrooms, the cafeteria, the office, the teacher’s lounge, outside near a

tree, near the parking lot, etc. The collectors should be placed where they can hang freely – not touching other surfaces and where they will not be touched by other students. Be sure to let the custodial staff know about your experiment, too.

5. After a week, retrieve the Stick 'em Up collectors and analyze. First, have the students make a quick inspection, reviewing the strips with the naked eye. What did they find? Next, have them inspect the strips with the magnifying glass or a microscope. What did they find?

Extension Activity

Make a traffic survey. Pick a location where students can observe a busy intersection from a

safe distance. Separately record the number of trucks, cars, buses, vans and taxis that pass through that intersection in a given hour. Repeat the activity for several days at different times during the day.

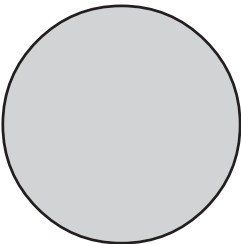
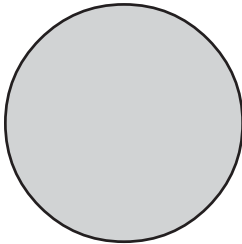
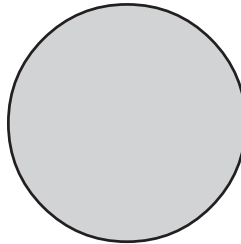
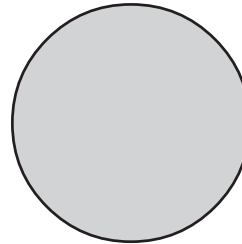
- **Ask:** What factors influence volume of traffic? (locations of highways, number of people in the community, shopping centers, businesses, special events, etc.)
- **Ask:** Did you see evidence of air pollution? (odors, smoke, wilted plants struggling to survive etc.)
- **Ask:** Do you think this is a problem? Why or why not. If so, what do you think should be done to correct it?

Name: _____

Location: _____

Date: _____ Time: _____

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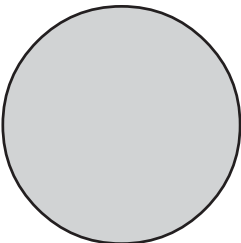
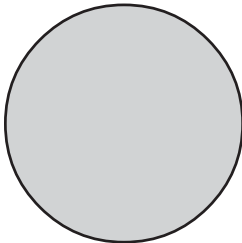
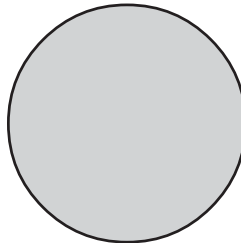
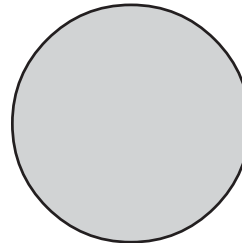
Stick 'em Up Collector

Name: _____

Location: _____

Date: _____ Time: _____

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Stick 'em Up Collector